CLAIMS

What is claimed is:

1. A radar system comprising:

an aircraft for detecting buried objects from the air, for overflying a target area of interest;

a radar transmitter, carried by the aircraft, for producing a radar signal of a frequency of at least three gigahertz;

a plurality of radar receiving antennas, carried by the aircraft and forming an antenna array, for receiving a reflected signal produced by reflection of said radar signal; and

a processor for generating a three-dimensional image of said object from the reflected signal.

2. The radar system of claim 1, wherein the radar signal frequency is within the range of three to ten gigahertz.

3. The radar system of claim 1, wherein said processor performs synthetic aperture beam processing based on movement of said radar transmitter and said antenna array relative to the target.

4. The radar system of claim 1, wherein said radar transmitter comprises a frequency-stepped pulse compression radar unit.

5. The radar system of claim 1, wherein said radar transmitter comprises an impulse-modulated radar unit.

6. The radar system of claim 1, wherein said aircraft includes wings and said array is disposed along said wings.

7. The radar system of claim 6, wherein said aircraft further comprises first and second booms each extending laterally outwardly from one of said aircraft wings, and said array includes radar receiving antennas disposed along each of said booms.

8. The radar system of claim 7, wherein said booms comprise extendable booms.

9. The radar system of claim 1, wherein signal processor filters a portion of the reflected signal corresponding to reflection from the surface of the target area.

10. The radar system of claim 1, wherein said process comprises an on-board processor disposed on the aircraft.

11. The radar system of claim 1, wherein the processor comprises an off-board processor.

12. A method for detecting a subsurface object in a target area from an aircraft, said method comprising the steps of:

transmitting a pulsed radar signal having a frequency of at least three gigahertz using a radar transmitter dispersed on the aircraft;

receiving a return of the transmitted signal reflected by the subsurface object with at least one of a plurality of radar receiving antennas disposed on the aircraft and forming a receiving antenna array; and

generating a three-dimensional image based on the received return of the transmitted signal.

13. The method of claim 12, wherein the radar signal frequency is within the range of three to ten gigahertz.

14. The method of claim 12, further comprising the step of identifying the object from the three-dimensional image.

15. The method of claim 14, wherein the step of identifying the object comprises the step of comparing the generated three-dimensional image to a stored image.

16. The method of claim 15, wherein the stored image comprises an image identifiable as a mine.

17. The method of claim 12, wherein the step of transmitting a radar signal comprises selecting a desired transmitting frequency to maximize image resolution.

18. The method of claim 12, further comprising a step of filtering out portions of the return signal corresponding to reflection of the target area surface.